



POL Products Guide

For Ground Vehicle and Equipment Materiel Systems

July 2010

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POL PRODUCTS GUIDE

This Petroleum, Oil and Lubricants (POL) Products Guide is designed as a quick reference to assist materiel and combat developers, supply and maintenance personnel, and other field users in properly using petroleum and its related product commodities that are common to the military supply system. The guidance being provided covers essentially fuels, fuel additives, lubricants, and associated products (e.g., hydraulic fluids, antifreeze, etc.) that are required and used in Army (and DOD) ground vehicles, equipment, and materiel. It also includes referee fuels and reference oils.

Individual product guides sheets have been developed and formatted to provide the maximum amount of information needed for using these POL Products. Each guide sheet covers a generic product type and includes such information as the relevant military/federal specification, military symbol and NATO Code Number, available container size and National Stock Number (NSN), product applications, temperature range limitation, and general comments relative to product usage.

This POL Products Guide is not intended to replace any military/ federal specification or the vehicle/equipment LUBE Order (LO), but merely to provide a quick reference source. This document will be updated periodically to accommodate changes in specifications, NSNs, etc.

As an example, this Guide will generate the following types of information on a typical product such as OE/HDO-15/40.

- OE/HDO-15/40 is the military symbol for the SAE 15W-40 Grade under MIL-PRF-2104. (Lubricating Oil, Internal Combustion Engine, Combat/Tactical Service).
- OE/HDO-15/40 is interchanged within NATO under Code Number O-1236. It is packaged in three (3) different size containers each having separate National Stock Numbers (NSN).
- OE/HDO-15/40 is one of four (4) different grades under MIL-PRF-2104. This oil is used in engines, hydraulic systems, transmissions, power steering units, and can be used in gear box units. However, one should consult the vehicle/equipment Lube Order (LO) if there is a question.
- OE/HDO-15/40, when used in either engines or transmissions, is acceptable for use in ambient temperatures ranging from approximately 0°F to 120°F.

The regulations governing responsibility for development and updating documents of this nature are listed as follows:

- Army Regulation 70-12, Fuels and Lubricants Standardization Policy for Equipment Design, Operation, and Logistic Support, 1 May 1997.
- Army Regulation 715-13, Engineering Support for Items Supported by Defense Logistics Agency, 13 March 1986.
- AMC Regulation 750-11, Use of Lubricants, Fluids, and Associated Products, 15 June 1986.

Questions relative to this document and its use should be directed to the following:

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Facsimile:

Commercial (586) 282-4244 DSN 786-4244

Email: POLhelp@us.army.mil

Any recommended change or additions to improve the overall utility of this POL Products Guide are welcome and will be appreciated.

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COMBAT/TACTICAL ENGINE OILS	DESCRIPTION
MIL-PRF-2104 - Lubricating Oil, Internal Combustion Engine, Tactical Service	These engine oils are designed for use in all combat and tactical diesel engine powered ground vehicles and equipment and includes performance requirements for power shift transmissions. Products are used also in many
MIL-PRF-46167 - Lubricating Oil, Internal Combustion Engine, Arctic	hydraulic, power steering, and gear box applications as specified by the Lube Orders (LO's). These oils are NOT to be used in HMMWV automatic transmissions, except under severe cold arctic conditions. The 10W grade

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performance criteria: in addition, selected C-4 (Almson) and YC-70 (Catelpina) transmission tests are mediated.				120	49								120	49	П					
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	Application (All Products)			★ Engine Svetems	Hydraulic	Systems	Transmission Systems	, A Downer	Steering	ıts	★ Non- bypoid Gear	Box Systems								
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	Z 0	4725 1427	01-132-4117 01-422-9346	01-152-4118	01-152-4119 01-421-1432	3988 1957	6727 6668	1946	1939	4726	7974	7988 •	9858	6729	8262	2862	01-433-7970	0000	2372	7197
	NSN 9150-	01-178-4725 01-421-1427	422-6	-152-4	01-152-4119	01-177-3988 01-496-1957 •	00-189-6727	01-496-1946	01-496-1939	01-178-4726	01-433-7974	01-160-0061 01-433-7988	00-188-9858	00-189-6729	01-433-7978	00-188-9862	433-		00-402-4478 00-402-2372	00-491-7197
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	ury ool rade)	ΑE				W)				-30						040	2		7-30)	
	Military Symbol (SAE Grade)	OE/HDO- 15/40 (SAE	w-40)			OE/HDO-10 (SAE 10W)				OE/HDO-30	(SAE 30)					OE/HDO-40	(SAE 40)		OEA-30 (SAE 0W-30)	
	(S)	OE 15/	CI			OE (S≯	,			OE	(S,					O	(S ₇	1		
	ry ation	2104																	46167	
	Military Specification	MIL-PRF-2104																	MIL-PRF-46167	
	Sp	MIL																	MIL	

Comments: The temperature ranges recommended for usage of the various grade oils conform with requirements established by the Lube orders (LO's) for the majority of the combat and tactical ground systems. However, requirements for some equipment may vary from these recommendations and individual equipment LO's must be consulted if there is a question as to the proper grade of lubricant which should be used. These engine oils can tolerate engine oil sump temps of 250°F as standard operation with spikes up to 275°F for short durations. However, for transmission operations the oils can withstand 300°F temps in the trans oil sump. The NSNs identified with a - ◆ - are for lubricants manufactured with a minimum of 25% re-refined basestock. The metal cans are only for Navy use due to their stacking requirements aboard ships. OE/HDO-15/40 and OE/HDO-10W are fully compatible with MIL-PRF-46170 (FRH) and MIL-PRF-6083 (OHT) and may be used as hydraulic fluids in some hydraulic systems. See page 15 for more information on tactical and combat hydraulic fluids. Please contact POLHelp prior to changing the hydraulic fluid in a vehicle system.

	TURB	INE]	ENGI	TURBINE ENGINE OILS		DESCRIPTION
MIL-PRF-23699 MIL-PRF-7808 -	- Lubricatin	g Oil, Aircr Oil, Aircra	aft Turbine E ft Turbine En	MIL-PRF-23699 - Lubricating Oil, Aircraft Turbine Engine, Synthetic Base MIL-PRF-7808 - Lubricating Oil, Aircraft Turbine Engine, Synthetic Base	e e	These oils are used as the engine lubricant for the Abrams series tank and other systems equipped with turbine engines. These oils are not for use in any ground engine systems powered by diesel or gasoline engines.
Military Specification	Military Symbol	NATO Code	Size Container	NSN 9150-	Application (All Products)	Ambient Temperature Range Usage
MIL-PRF-23699	NONE	O-152	Class C/I 7.5-Oz	00-180-6266		FOR TURBINE ENGINE
			1-Qt 55-Gal	00-985-7099 00-681-5999	★ Turbine	EXPECTED TEMPERATURES
		154	OTITE STATE		Engines Only	oF <-50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120
		O-154	Class H15 7 5-07	01-439-0764		°C <-46 -40 -34 -29 -23 -18 -12 -7 -1 4 10 16 21 27 32 38 44 49
			1-QT	01-439-0756		MIL-PRF-7808 (O-163) Grade 4
			55-Gal	01-439-2070		MIL-PRF-23699 (O-156)
		0-156	Class STD			MIL-PRF-7808 (O-148) Grade 3
			7.5-Oz 1-Ot	01-476-1075		
			55-Gal	01-476-1083		
MIL-PRF-7808 NONE	NONE	0-148	s-Oz	00-108-5359		
			1-Qt	00-782-2627		
			1-Gal 55-Gal	00-270-4057		
			00-00	(107-701-00		
		0-163	1-Qt	01-414-5926		
			1-Gal 55-Gal	01-414-5927 01-414-8141		
			3000	****		

Comments: The temperature ranges recommended for usage of the turbine engine oils conform with requirements established by the Lube Orders (LO) for the MI/MIA1 series tank. Requirements for other ground equipment may vary from these recommendations. LO's must be consulted if there is a question as to the proper lubricant which should be used. Prolonged skin contact with either oil should be avoided since it may cause skin rash. Areas using these oils should be well ventilated. Do not intermix these oils with other gasoline or diesel engine oils since damage to internal components will occur.

THESE RECOMMENDATIONS DO NOT APPLY TO AIRCRAFT.

DESCRIPTION	
AUTOMOTIVE ENGINE/PRESERVATIVE	OILS

MIL-PRF-21260 - Lubricating Oil, Internal Combustion Engine, Preservative and Break-In

These engine oils are designed for preservation, break-in, and use in all combat/tactical diesel powered ground vehicles and equipment systems. These oils are operational oils meeting MIL-PRF-2104G requirements in addition to corrosion and preservation requirements. These products can be used where MIL-PRF-2104G oils are specified until the first recommended oil change or 50 hrs of operation, whichever comes first. These oils meet the API CF, modified CF-2, and CG-4 performance criteria. PE-10 grade is not for use in high output 2-cycle diesel engines.

cycle dieset engines.	Ambient Temperature Range Usage (See Comments)	FOR ENGINE SYSTEMS	of c-50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 12 12 0 100 110 12 0 12 0 1	°C < -46 -40 -34 -29 -23 -18 -12 -7 -1 4 10 16 21 27 32 38 44 4 PE-10 (C-640)	PE-30 (C-642)	PE-40 (NONE)	PE-15/40 (NONE)	FOR TRANSMISSION AND HYDRAULIC SYSTEMS	EXPECTED TEMPERATURES	°F <-50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 12	°C <-46 -40 -34 -29 -23 -18 -12 -7 -1 4 10 16 21 27 32 38 44 4	PE-15/40 (NONE)	PE-10 (C-640)	
	Application (All Products)		00-111-3199 Storage Engines, 00-111-0208 Hydraulic, and	Transmission Systems	00-111-0210 * Break-In of New	and Rebuilt Engine and Powertrain	Systems							
	NSN 9150-	01-293-2772	00-111-3199	00-111-0201 00-153-0207 00-111-0209	00-111-0210	01-293-2773								
	Size Container	55-Gal	5-Gal 55-Gal	1-Pt 1-Qt 5-Gal	55-Gal	5-Gal	i)							
	NATO Code	NONE	C-640	C-642		NONE								
	Military Symbol (SAE Grade)	PE-15/40 (SAE 15W-40)	PE-10 (SAE 10W)	PE-30 (SAE 30)		PE-40	(SAE 40)							
	Military Specification	MIL-PRF-21260 PE-15/40 (SAE 15/40												

120

120

Comments: The temperature ranges recommended for usage of the various grade oils conform with requirements established by the Lube Orders (LO) for the majority of the combat and tactical ground systems. However, requirements for some equipment may vary from these recommendations and individual equipment LO's must be consulted if there is a question as to the proper grade of lubricant which should be used. These oils are also utilized for the preservation of vehicles/equipment fuel systems.

	PRE	SER	VATIV	PRESERVATIVE OILS		UNCLASSIFIED DESCRIPTION
MIL-PRF-32033 - Lubricating Oil, General Purpose, Pre Low Temperature) MIL-PRF-3150 - Lubricating Oil, Preservative, Medium MIL-PRF-46002 - Preservative Oil, Contact and Volatile	- Lubricati Low Te - Lubricatin - Preservat	Abricating Oil, Ger Low Temperature) Ibricating Oil, Press reservative Oil, Co	neral Purpos) ervative, Me ontact and Ve	MIL-PRF-32033 - Lubricating Oil, General Purpose, Preservative (Water-Displacing, Low Temperature) MIL-PRF-3150 - Lubricating Oil, Preservative, Medium MIL-PRF-46002 - Preservative Oil, Contact and Volatile Corrosion-Inhibited	ater-Displacing,	MIL-PRF-32033 is a water-displacing, preservative lubricating oil for general purpose lubrication and protection against corrosion of certain small arms and whenever a general purpose, low temperature lubricating oil is required. MIL-PRF-32033 can be applied by dipping, brushing or spraying from gas-pressurized cans. MIL-PRF-3150 is a general purpose preservative oil for ferrous and non-ferrous metals. It is not intended for protection of internal combustion engines. MIL-PRF-3150 can be applied by dipping or brushing; it is too viscous for spraying. MIL-PRF-46002 is a volatile corrosion inhibited oil for use in the preservation of materiel in enclosed systems where the volatile components will provide protection above the fluid level. It can also be used as a contact preservative.
Military Specification	Military Symbol	NATO Code	Size Container	NSN 9150-	Application	Ambient Temperature Range Usage
MIL-PRF-32033	PL-S	0-190	1/2-0z 1-0z 4-0z 16-0z 16-0z 1-Qt 1-Gal 5-Gal 55-Gal	00-836-8641 00-261-8146 00-273-2389 00-458-0075 01-374-2021 00-231-9045 00-231-9062 00-281-2060	(Aerosol) (Sprayer) * Preservation and Lubrication of Materiel	°F <-550 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120 °C <-46
MIL-PRF-3150	PL-M	0-192	4-Oz 1-Qt 5-Gal 55-Gal	00-271-8427 00-231-2361 00-231-2356 00-231-2357		MIL-PRF-46002, Grade 2
MIL-PRF-46002	NONE	NONE	1-Qt 5-Gal 55-Gal	00-889-3523 00-985-7293 00-407-0973	* Preservation of non-wetted Surfaces	

Comments:

MIL-PRF-32033 is a light preservative oil which is also water-displacing. It has been found to wash away with water, so must be reapplied. MIL-PRF-3150 is a medium weight preservative oil with much more stringent corrosion inhibiting requirements, so may be a superior preservative oil for many applications which can tolerate a more viscous oil.

UNCLASSIFIED	DESCRIPTION	These gear lubricants are for use in differentials and manual transmissions, heavy duty industrial type enclosed gear units, steering gears, and fluid lubricated universal joints of automotive ground equipment. These lubricants are not intended for use in automatic transmission or power steering systems. The oils under SAE J2360 meet the API GL-5 and MT-1 (class 7/8 manual transmission) performance criteria.	Ambient Temperature Range Usage (See Comments)	EXPECTED TEMPERATURES	°F <-56	(0-12)		
		05)	Application (All Products)	★ Axles★ Differentials	★ Final Drives ★ Heavy Duty Industrial type Enclosed Gear Units	★ Manual Transmission	★ Steering Gears ★ Wire Rope	* Fluid Lubricated Universal Joints
	GEAR LUBRICANTS	usly MIL-PRF-21	NSN 9150-	01-035-5390 01-048-4593 01-035-5391	01-035-5392 01-422-9329• 01-035-5393 01-422-9335• 01-035-5394 01-422-9340•	01-048-4591 01-035-5395 01-035-5396	00-001-9395 01-422-9342•	
	BRIC	pose (previo	Size Container	1-Qt 1-Gal 5-Gal	1-Qt 5-Gal 55-Gal	1-Qt 5-Gal 55-Gal	5-Gal	
	RLU	r, Multipu	NATO Code	0-186	0-226	0-228	0-226	
	GEA]	SAE J2360 - Lubricating Oil, Gear, Multipurpose (previously MIL-PRF-2105)	Military Symbol (SAE Grade)	G0-75 (SAE 75W-90)	GO-80/90 (SAE 80W-90)	GO-85/140 (SAE 85W-140)	GO-80/90 (SAE 80W-90) LIMITED SLIP	
		SAE J2360 - Lu	Military Specification	SAE J2360				

Comments: The temperature ranges recommended for usage of the various oils conform with requirements established by the Lube Orders (LO) for the majority of the combat and tactical ground systems. However, requirements for some equipment may vary from these recommendations and individual LO's must be consulted if there is a question as to the proper grade of lubricant which should be used. Limitedslip differentials allow unequal torque to be transmitted to each axle and require the use of special friction modified gear lubricants. For these applications those gear lubricants designated "GO-80/90 LIMITED SLIP" are required. The friction-modified oils can be used in standard (non limited-slip) differentials, without any adverse effect. The NSNs identified with a - • - are for gear lubricants manufactured with a minimum of 25% re-refined basestock.

	OLID	FILM	1 LUB	SOLID FILM LUBRICANTS	S	UNCLASSIFIED DESCRIPTION
MIL-PRF-46010 MIL-PRF-46147	·	 Lubricant, Solid Filn Code Number S-1738 Lubricant, Solid Filn 	ilm, Heat Cur 8 Im, Air-Cured	 Lubricant, Solid Film, Heat Cured, Corrosion Inhibiting, Code Number S-1738 Lubricant, Solid Film, Air-Cured, Corrosion Inhibiting 	oiting, NATO	WIL-PRF-46010 is dispersion of lubricating solids suspended in an adhesive binder that upon application and heat curing provides a solid lubricating surface. MIL-PRF-46147 is a dispersion of lubricating solids suspended in an adhesive binder that can be applied to a surface work at room temperature to form the solid lubricating surface. MIL-1-34308 is similar to MIL-PRE-46147 except it provides corresion protection against exposure to sulfingues.
MIL-L-23398	- Lubrica Code Nu	- Lubricant, Solid Fil Code Number S-749	lm, Air-Cured	- Lubricant, Solid Film, Air-Cured, Corrosion Inhibiting, NATO Code Number S-749	ing, NATO	acid, but does not have the same wear properties.
Military Specification	Military Symbol	NATO Code	Size Container	NSN 9150-	Application (All Products)	Ambient Temperature Range Usage
MIL-PRF-46010 Type III	NONE	S-1738	1-Gal	01-416-9506 (Natural)	* Special Uses	
			I-Gal	(Black)		©F <-50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120
MIL-PRF-46147 Type 1-Can	NONE		1-Qt	01-360-1908		°C <-46 -40 -34 -29 -23 -18 -12 -7 -1 4 10 16 21 27 32 38 44 49 MIL-PRF-46010 (S-1738)
			1-Qt	01-360-1909		MIL-PRF-46147
Type 1-Aerosol	NONE		1-Gal 12 Oz.	00-142-9361 01-360-1904	Form 1-Color 1 Form 2-Color 2	MIL-L-23398 (S-749)
			16 Oz. 12 Oz. 16 Oz.	01-360-1906 01-360-1903 01-360-1905		
Type II	NONE			01-500-2751 01-500-2795 01-500-2801 01-500-3017 01-500-3104 01-500-3108 01-500-3114		
MIL-L-23398	NONE	S-749	16 Oz. 1 Qt.	01-260-2534 00-954-7422	(Aerosol)	
					;	

Comments: MIL-PRF-46010 provides both high load carrying capacity and long wear life and also both types of corrosion protection. MIL-PRF-46010 is low in volatile organic compound content and lead free. SAE AS 5272 is an older version of MIL-PRF-46010 and continues to have Types I, II, and III for Aerospace use. MIL-PRF-46147 has two types. Type I, available in bulk form only, has a lower endurance life than Type I. The aerosol form provides in-field use capability. Both MIL-PRF-46010 and MIL-PRF-46147 are available in black and natural colors. MIL-L23398 is similar to MIL-PRF-46147 except for performance differences noted in the Description section above.

	WEA	PON	LUBR	WEAPON LUBRICANTS		UNCLASSIFIED DESCRIPTION
MIL-PRF-14107 - Lubricating Oil, Weapons, Low Temperature	- Lubricatin	g Oil, Weap	ons, Low Ter	nperature		MIL-PRF-14107 is a low temperature preservative and lubricating oil for aircraft and small caliber ground weapons.
MIL-L-46000 * - Lubricant, Semi-Fluid (Automatic Weapons)	Lubricant, S	emi-Fluid (.	Automatic Wo	eapons)		MIL_L-46000* is a semi-fluid lubricant for automatic weapons under conditions of extreme pressure for use in all temperatures.
MIL-L-46150 - Lubricant, Weapons, Semi-Fluid (High Load Carrying Capacity)	Cubricant, W	¹eapons, Seı	mi-Fluid (Hig	h Load Carrying	Capacity)	MIL_L-46150 is a semi-fluid lubricant, containing "Teflon", for the 7.62 mm machine gun and for other applications requiring an extreme pressure (high load) lubricant with a low coefficient of friction.
MIL-PRF-63460 - Lubricant, Cleaner and Preservative for Weap Systems (Metric) MIL-PRF-85336 - Lubricant, All Weather (Automatic Weapons)	- Lubricant, Cles Systems (Metric) - Lubricant, All	, Cleaner ar etric) , All Weath	nd Preservativ	MIL-PRF-63460 - Lubricant, Cleaner and Preservative for Weapons and Weapons Systems (Metric) MIL-PRF-85336 - Lubricant, All Weather (Automatic Weapons)	d Weapons	MIL-PRF-63460 is a cleaner, lubricant and short term preservative for both small and large caliber weapons for use in a field environment where ease of application and convenience of a single product are important. It is usable in all climatic conditions. MIL-PRF-85336 is a petroleum and/or synthetic corrosion inhibited semi-fluid intended for lubrication of aircraft weapons.
Military Specification	Military Symbol	NATO Code	Size Container	NSN 9150-	Application (All Products)	Ambient Temperature Range Usage
MIL-PRF-14107	LAW	0-157	1-Qt 5-Gal	00-292-9689 00-292-9687	* Small caliber Weapons	EXPECTED TEMPERATURES
MIL-L-46000	LSA	O-158	2-0z 4-0z 1-Qt	00-935-6597 00-889-3522 00-687-4241	★ Large caliber Weapons	oF <550 40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120 oC <46 40 -34 -29 -23 -18 -12 -7 -1 4 10 16 21 27 32 38 44 49 19 10 11
			1-Gal	00-753-4686	4	LSA (O-158)
MIL-L-46150	LSAT-T	NONE	8-Oz 1-Lb	00-949-0323	* Small caliber	LSAT
					weapons	CLP (S-758)
MIL-PRF-63460	CLP	S-758	1/2-Oz	01-102-1473	★ Small and	MILPRF-85336
			4-Oz	01-079-6124	Large Automatic	
			1-rt 1-Lt 1-Gal	01-054-0453 01-327-9631 01-053-6688	Weapons	
MIL-PRF-85336	NONE	NONE	1-Qt	01-104-5227	* See Comments	

Comments:
MIL-PRF-63460 may be used instead of MIL-PRF-372 (Rifle Bore Cleaner), MIL-PRF-32033 (Low Temperature Preservative Lubricating Oil), and MIL-PRF-3150 (Medium Preservative Lubricating Oil).
MIL-PRF-14107, MIL-L-46000 and MIL-L-46150 may be used for specific applications where tests have shown it to be satisfactory for large and small caliber weapons.
MIL-PRF-85336 is intended for use on 20 mm rotary guns on almost all parts. It reduces corrosion in marine environments, permits high firing rates at low temperatures, and permits operation under icing conditions.

^{*} Specification is Inactive for New Design.

TAC	CTICAL	HYI	DRAU	TACTICAL HYDRAULIC FLUID	OIDS	UNCLASSIFIED DESCRIPTION
MIL-PRF-46170 MIL-PRF-6083 MIL-H-53119 -) - Hydraulic F Base - Hydraulic Fl Hydraulic Flui	luid, Rust Is luid, Petrole d, Nonflam	nhibited, Fir	 MIL-PRF-46170 - Hydraulic Fluid, Rust Inhibited, Fire Resistant, Synthetic Hydro Base MIL-PRF-6083 - Hydraulic Fluid, Petroleum Base for Preservation and Operation MIL-H-53119 - Hydraulic Fluid, Nonflammable, Chlorotrifluoroethylene Base 	MIL-PRF-46170 - Hydraulic Fluid, Rust Inhibited, Fire Resistant, Synthetic Hydrocarbon Base MIL-PRF-6083 - Hydraulic Fluid, Petroleum Base for Preservation and Operation MIL-H-53119 - Hydraulic Fluid, Nonflammable, Chlorotrifluoroethylene Base	and hydraulic systems. MIL-PRF-6083 is a petroleum based hydraulic fluid. Type I is undyed and is intended for tank recoil and hydraulic systems. MIL-PRF-6083 is a petroleum based hydraulic fluid for use as a recoil and hydraulic fluid in howitzers and certain other equipment where MIL-PRF-46170 is not used. MIL-H-53119 is a chlorotrifluoroethylene (CTFE) based hydraulic fluid which is nonflammable to all known flammability hazards. It is to be used only in hydraulic systems which are specifically designed for its use. All fluids meet stringent particle cleanliness standards. MIL-PRF-6083 and MIL-PRF-46170 are rust inhibited and are used both as preservatives for hydraulic systems and components as well as being operational fluids.
Military Specification	Military Symbol	NATO Code	Size Container	NSN 9150-	Application	Ambient Temperature Range Usage
MIL-PRF-46170 Type I (yellow)	FRH	H-544	1-Pt 1-Qt 1-Gal 5-Gal 55-Gal	01-332-7819 00-111-6256 00-111-6254 00-111-6255 01-158-0462	* Hydraulic Systems * Gum Recoil Systems * Tank Suspension	°F <-50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120 °C <-46 -40 -34 -29 -23 -18 -12 -7 -1 4 10 16 21 27 32 38 44 49
MIL-PRF-6083	ОНТ	C-635	Aerosol 1-Qt 1-Gal 5-Gal 55-Gal	00-159-4472 00-935-9807 00-935-9808 00-935-9809 00-935-9810	Systems	OH1 (C-635) FRH (H-544) NFH
MIL-H-53119*	NFH	NONE	none at this time	none at this time	* ASM Vehicles	

Comments: MIL-PRF-6083 and MIL-PRF-83282 (H-537) is the non-corrosion inhibited version of MIL-PRF-6083 and is not authorized for Army ground equipment. MIL-PRF-83282 (H-537) is the non-corrosion inhibited version of MIL-PRF-46170 and is not authorized for use in Army ground equipment. However, MIL-PRF-5606 and MIL-PRF-83282 may be used as emergency substitutes for MIL-PRF-6083 and MIL-PRF-46170. MIL-H-53119 is not compatible with either MIL-PRF-6083, MIL-PRF-46170, MIL-PRF-5606, MIL-PRF-83282, MIL-PRF-87257 and cannot be used as an emergency substitute for those fluids. MIL-PRF-6083 has a flash point of at least 82°C, MIL-PRF-46170 has a flash point of at least 218°C, and MIL-H-53119 has no flash point (is nonflammable).

OE/HDO-15/40 and OE/HDO-10W (see page 6) are compatible with MIL-PRF-46170 and MIL-PRF-6083 may be able to be used in hydraulic systems. Please contact POLHelp prior to changing the hydraulic fluid in a vehicle system.

^{*} Inactive for New Design.

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UNCLASSIFIED

BIO	BIOBASED HYDRAULIC FLUID	HYD	RAUL	IC FLU	IID	UNCLASSIFIED DESCRIPTION
MIL-PRF-32073 ·	MIL-PRF-32073 - Hydraulic Fluid, Biobased	Biobased				MIL-PRF-32073 is a hydraulic fluid intended for use in hydraulic systems constructions equipment, bridging, tactical vehicles (when specified), shipboard systems, and metal working tools.
Military Specification	Military Symbol NATO (Grade)	NATO Code	Size Container	NSN 9150-	Application	Ambient Temperature Range Usage
MIL-PRF-32073	Grade 1 (ISO VG 15)	NONE	1-Gal 5-Gal 55-Gal	01-498-0268 01-498-0315 01-498-0014		9F <-50
	Grade 2 (ISO VG 22)	NONE	1-Gal 5-Gal 55-Gal	01-498-1483 01-498-1468 01-498-1481		Grade 2
	Grade 3 (ISO VG 32)	NONE	1-Gal 5-Gal 55-Gal	01-503-1775 01-503-1759 Not Avail yet		Grade 3 Crade 4
	Grade 4 (ISO VG 46)	NONE	1-Gal 5-Gal 55-Gal	01-498-1518 01-498-1492 01-498-1487		Grade 5
	Grade 5 (ISO VG 68)	NONE	1-Gal 5-Gal 55-Gal	01-498-1522 01-498-1523 01-498-1524		

Comments: MIL-PRF-32073 covers five viscosity grades. Selection of viscosity grades should be based on the low temperature operational requirement. These hydraulic fluids are intended for use in environmentally sensitive areas such as construction, forestry, river and mining. If used in any other equipment of hydraulic systems, a study should be made to determine its applicability for the systems.

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MACH	MACHINE TOOL HYDRAULIC FLU)L H	[YDRA	ULICE	4LUID	UNCLASSIFIED DESCRIPTION
A-A-59354 Hydı	A-A-59354 Hydraulic Fluid, Petroleum Base, For Machine Tools	um Base,	For Machine	Tools		A-A-59354 hydraulic fluid intended for use in hydraulic systems of metal-working tools which require anti-wear oils.
Military Specification	Military Symbol NATO (Grade)	NATO Code	Size Container	NSN 9150-	Application	Ambient Temperature Range Usage
A-A-59354	Grade 1 (ISO VG 32) Grade 2 (ISO VG 46) Grade 3 (ISO VG 68) Grade 4 (ISO VG 150)	NONE NONE NONE NONE	5-Gal 55-Gal 5-Gal 5-Gal 5-Gal 55-Gal 55-Gal 55-Gal	00-966-8830 00-966-8834 00-966-8833 00-966-8832 00-966-8835 00-966-8835		°F <-50 40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 110 120 °C <-46

Comments: A-A-59354 covers four viscosity grades. Selection of viscosity grades should be based on the recommendation of the machine tool manufacturer. These hydraulic fluids may also be used in application requiring corrosion-inhibiting and oxidation-resistant lubricating oils.

AUTO	MA	ric '	TRAN	AUTOMATIC TRANSMISSION FLU	FLUID	UNCLASSIFIED DESCRIPTION
GM 6297-M , Automatic Transmission Fluid	rutomatic	Transmis	sion Fluid			GM 6297-M is intended for use in automatic transmissions in GM and AMC manufactured administrative and some tactical vehicles. The transmission of these vehicles requires fluids with special frictional characteristics.
Specification Military NATO Symbol Code	Military Symbol	NATO Code	Size Container	NSN	Application (All Products)	Ambient Temperature Range Usage
GM 6297-M NONE	NONE	NONE 1 Qt 5 Gal 1 Qt 55 G	1 Qt 5 Gal 1 Qt HDPE 55 Gal	9150-00-698-2382 9150-00-657-4959 9150-01-353-4799 9150-01-114-9968	Automatic Transmissions	PF <-50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120 (C <-46 -40 -34 -29 -23 -18 -12 -7 -1 4 10 16 21 27 32 38 44 49 (C <-46 -40 -34 -29 -23 -18 -12 -7 -1 4 10 16 21 27 32 38 44 49

Comments: This fluid shall only be used in tactical vehicles when explicitly required by the Military Lubrication Orders (LO). However, it is not intended for Arctic conditions where temperatures go below -40°F. Use lubricants under MIL-PRF-46167 for Arctic conditions.

	BR	AKE	BRAKE FLUID	D		UNCLASSIFIED DESCRIPTION	
MIL-PRF-46176	MIL-PRF-46176 - Brake Fluid, Silicone, Automotive, All Weather, Operational and Preservative, Metric	licone, Aut ric	omotive, All	Weather, Opera	ational and	MIL-PRF-46176 is a silicone brake fluid classified as DOT 5 which is resistant to water and prevents corrosion. It also meets SAE J1705 (Low Water Tolerant Brake Fluids).	events corrosion. It
Military Specification	Military Symbol	NATO Code	Size Container	NSN 9150-	Application	Ambient Temperature Range Usage	
MIL-PRF-46176 BFS	BFS	H-547	1-Gal 5-Gal 55-Gal	01-102-9455	* Brake Systems	°F <-50 40 -30 -20 -10 0 10 20 30 40 50 60 70 80 9 °C <-46	90 100 110 120 32 38 44 49

Comments:
MIL-PRF-46176 is a corrosion inhibiting brake fluid that has a higher vapor lock temperature than conventional SAE 1703 or DOT 3 brake fluids (i.e., glycol ether base brake fluid). It can be used in arctic environments and also functions as a preservative fluid in storage/prepositioning applications.

MIL-PRF-46176 is not compatible with conventional DOT 3 and DOT 4 brake fluids. DOT 5 is a silicone brake fluid similar to MIL-PRF-46176, but has slightly different viscosity properties.

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	TAG	CTIC	AL G	TACTICAL GREASES		UNCLASSIFIED DESCRIPTION
MIL-PRF-10924 - Grease, Automotive and Artillery MIL-PRF-81322 - Grease, Aircraft, General Purpose, Wide Temperature Range	- Grease, A	Automotive Aircraft, Ge	and Artillery	, Wide Tempera	ıture Range	MIL.PRF-10924 covers one grade of a multi-purpose biodegradable grease for lubrication and surface corrosion protection of all ground vehicles and equipment. MIL.PRF-81322 covers a general purpose grease for use in aircraft accessories. These greases are not intended for use on machinery which comes in contact with food.
Military Specification	Military Symbol	NATO Code	Size Container	NSN 9150-	Application	Ambient Temperature Range Usage
MIL-PRF-10924	GAA	G-403	2-1/4 oz 14-oz 1.75- lb 6.5-lb 35-lb 120-lb 370-Lb	01-197-7688 01-197-7693 01-197-7690 01-197-7689 01-197-7691 01-197-7691	* Automotive Wheel Bearing and Chassis System * Artillery * Ground Equipment * General	EXPECTED TEMPERATURES °C <-46 -40 -34 -29 -23 -18 -12 -7 -1 4 10 16 21 27 32 38 44 49 PC <-46
MIL-PRF- 81322	WTR	G-395	8-oz 1-lb 5-lb 35-lb	00-181-7724 00-944-8953 00-145-0268 00-935-5851	* Aircraft Wheel Bearings * Anti-friction Bearings * Gear Box * Plain Bearings	

Comments: MIL-PRF-10924 is lithium complex grease and bio-degradable grease. It is designed for use over a wide operating temperature and in a saltwater corrosion environment. Most of MIL-PRF-81322 greases are clay-thickened greases and they may not be fully compatible with MIL-PRF-10924 greases. Both greases can be used where bearing temperatures range from -54°C to 180°C.

	Gı	ENER	AL GR	GENERAL GREASES		UNCLASSIFIED DESCRIPTION
VV-G-632 - Grease, Industrial, General Purpose VV-G-671 - Grease, Graphite	Grease, Indus Grease, Grapi	strial, Genera hite	ıl Purpose			VV-G-632 and VV-G-671 each cover one grade of a lubricating grease intended primarily for the lubrication of machinery which is equipped with compression type grease cups. VV-G-671 covers graphite grease and provides a higher load-carrying capacity than VV-G-632 grease.
Military Specification	Military Symbol	NATO Code	Size Container	NSN 9150-	Application	Ambient Temperature Range Usage
VV-G-632	NONE	NONE	8-oz 35-lb	00-753-4649 00-273-2374	★ General Equipment and Machinery	°F <-50 40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110 120
VV-G-671	GG2	G-412	1.75-lb 6.5-lb	00-190-0918 00-190-0919	* General Equipment and Machinery requiring a Graphite Grease	°C < -46 -40 -34 -29 -23 -18 -12 -7 -1 4 10 16 21 27 32 38 44 49 49 49 49 49 49 4

Comments: Neither of these greases are inhibited against oxidation or corrosion under adverse conditions. Caution is advised in using these greases in non-specified applications. Particularly, the use of graphite grease in non-specified applications should be done only after evaluating its compatibility with all involved materials. Consult Lube Order (LO) for specific guidance. VV-G-671 contains 4.5 to 5.5% graphite.

ANTIFREEZE A-A-52624 Antifreeze, Multi Engine Type A-A-51461 Test Kit, Test Strips and Color	TIFR Antifreeze, Mu fest Kit, Test 8	EEZ	ZE AN: Type Color Chart, A	ANTIFREEZE AND TEST K. A-A-52624 Antifreeze, Multi Engine Type A-A-51461 Test Kit, Test Strips and Color Chart, Antifreeze, Freeze Point and	KIT and Nitrite	UNCLASSIFIED A-A-52624 covers a fully formulated commercial antifreeze for use in tactical/combat liquid-cooled internal Combustion engines other than aircraft. It covers two types and each type can have up to three concentrations as follows: Type I: Ethylene Glycol Based; Type II: Propylene Glycol Based. Concentration A : 1000/ Glycol by solution Concentration C
255	Type II					Glycol by volume. The concentrated versions (Type 1A or Type IIA) must be blended prior to using in radiator. A-A-51461 Type II covers a test strip kit for determining both the freeze point and nitrite concentration of antifreeze.
Military Specification	Military Symbol	NATO Code	Size Container	NSN 6850-	Application	Ambient Temperature Range Usage
A-A-52624	NONE	S-750	1-Gal	01-464-9125	Multi Engines	EXPECTED TEMPERATURES
(V urgin) Type 1A			5-Gal CO 1-QT	01-441-3221 00-664-1399		<-50
(Virgin) Type IIA			55 Gal DR Box/6, 1Gal	01-383-3918 01-383-4244	Multi Engines	°C < -46 -40 -34 -29 -23 -18 -12 -7 -1 4 10 16 21 27 32 38 44 49
(Virgin) Type 1B			1 Gal 5 Gal CO	01-441-3234 01-441-3240	Arctic condition	A-A-52624 Type (I & II - C)
(Recycled)	NONE	NONE	1-Gal CO	01-464-9125	Multi Engines	A-A-51461
13704			55 Gal DR	01-464-9152		* A mixture of 60% A-A-52642 Types I and II and 40% water will provide freeze protection down to approximately -56°F (-49°C).
A-A-52624 Recycled Type IB	NONE		1-Gal 5-Gal CO 55-Gal DR	01-464-9266 01-464-9263 01-464-9096	Arctic condition	
Recycled Type IIA	NONE		1Gal 5-Gal 55-Gal	01-383-4068 01-441-3257 01-383-3918	Multi Engines	
Recycled Type IC	NONE		1-Gal 5-Gal CO 55-Gal DR	01-471-6530 01-471-6534 01-471-6521	Multi Engines	
A-A-51461	NONE	NONE	Kit	Type II (See comment)	A-A-52624 coolants	

Comments: Use commercial test strips that test for freeze point and nitrite concentration for both ethylene glycol and propylene glycol based coolants.

DESCRIPTION	This product is used primarily used in turbine fuels to cope with small amounts of water contamination (entrained water), or to keep separated water from freezing. Military turbine fuels (JP-4, JP-5 and JP-8) are procured with the Fuels System Icing Inhibitor (FSII) already in the fuel. Additional FSII is not added to these fuels except under special circumstances (e.g., removal of the original FSII by water contact). FSII can also be added to commercial turbine fuels (ASTM D 1655) which do not already contain it in order for these fuels to be brought up to military standards if so authorized. FSII can also be used in diesel fuels (A-A-52557, ASTM D 975) to meet low temperature needs. FSII has no effect on the diesel fuel cloud point (wax formation tendency).	Ambient Temperature Range Usage	FOR FUEL STORAGE AND VEHICLE FUEL SYSTEMS	EXPECTED TEMPERATURES	0 10 20 30 40 50 60 70 80 90 100 110 120	-18 -12 -7 -1 4 10 16 21 27 32 38 44 49	FSII (S-1745)	
UNCLASSIFIED	This product is used primarily used water, or to keep separated water fluels System Icing Inhibitor (FSII) special circumstances (e.g., removaturbine fuels (ASTM D 1655) which standards if so authorized. FSII can needs. FSII has no effect on the dies		FOR		°F <-50 40 -30 -20 -10	°C < 46 40 -34 -29 -23		
VE		Application (All Products)	> Bulk and Intermediate	Fuel Tanks	> Fuel	Transport	venicles and Fuel Cells	
FUEL ANTI-ICING ADDITIVE	High Flash	NSN	6850-01-057-6427 6850-01-089-5514					
I-ICIN	MIL-DTL-85470, Inhibitor, Icing, Fuel System, High Flash	Size Container	5 Gal 55 Gal					
ANT	itor, Icing,	NATO	S-1745 5 Gal 55 Ga					
UEL	470, Inhibi	Military Symbol	FSII					
F	MIL-DTL-85	Military Specification	MIL-DTL- 85470					

Addition instructions: FSII should only be added to turbine fuels by direction of the Petroleum Officer. To determine the level of FSII in turbine fuels, use ASTM D 5006.. Prescribed levels of FSII for turbine fuels are as follows: JP-4, 0.10 to 0.15 to 0.20 vol %; JP-8, 0.10 to 0.15 vol %; JP-8, 0.10 t at selected Air Force bases; otherwise use batch addition and mixing. Recommended level of FSII to diesel fuel (A-A-52557, ASTM D 975) is 0.15 vol %. Addition can be accomplished batch-wise by adding FSII on top of the fuel in a storage tank or tank truck, mixing can be accomplished by recirculating the fuel for at least 5 minutes for each 1000 gallons at a rate of at least 50 gallons per minute.

Diethylene glycol monomethyl ether (DIEGME) is hazardous to health. Before handling DIEGME, proper safety precautions should be followed. Avoid contact with skin and eyes by wearing protective gloves and goggles. Read the instructions on the container and the Materials Safety Data Sheet (MSDS) before handling the additive. Use the recommended protective equipment. In case of leaks or spills, follow the instructions in the MSDS for disposal.

FUEL 1	BIOC	ZIDE,	/STABIL	FUEL BIOCIDE/STABILIZER ADDI	JITIVE	TIVE UNCLASSIFIED DESCRIPTION
MIL-S-53021 - Stabilizer Additive, Diesel Fuel	Stabilize	r Additive	., Diesel Fuel			MIL-S-53021 is for use in diesel fuel (A-A-52557, ASTM D 975) intended for intermediate (6-24 months) or long term (25-60 months) storage. This additive is designed to retard or prevent the formation of fuel deterioration
						products (i.e., gums, sludge, particulates, etc.) resulting from auto-oxidation, to reduce the potential for microbiological growth, and to provide for corrosion protection of fuel-wetted surfaces. This additive is for the treatment of fuel in (1) depot facilities where vehicles/equipment are in re-build or storage, (2) pre-positioned materiel at locations involving storage of equipment partially or fully fueled, and (3) fuel stocks intended for intermediate or long-term storage. Fuels treated with this additive shall not be used in aircraft.
Military Specification	Military Symbol	Military NATO Symbol Code	Size Container	NSN	Application	Ambient Temperature Range Usage
MIL-S-53021					★ Bulk and	FOR FUEL STORAGE AND VEHICLE FUEL SYSTEMS
Type I	NONE	NONE 5 Gal	5 Gal 55 Gal	6850-01-246-6544 6850-01-246-6545	Intermediate Fuel Storage	EXPECTED TEMPERATURES
				210000	Lanks	<-50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100 110
Type II: Biocide	NONE	NONE	5 Gal (Use both NSNs)	6840-01-173-6940 Transport 6850-01-167-4789	★ Fuel Transport	°C <-46 -40 -34 -29 -23 -18 -12 -7 -1 4 10 16 21 27 32 38 44 49 49 49 49 49 49 4
Biocide Stabilizer			55 Gal (Use both NSNs)	6840-01-041-0098 6850-01-167-4788	v enicies and Fuel Cells	
CIGOTITECT						

Comments: There are two types of stabilizer additives that have been qualified: the one package (Type I) and two package (Type II) systems. In the two-package type (i.e., Type II), the biocide is in one package or container, and the remaining additives are in the other. In most cases, both packages in Type II must be ordered and used together for maximum effectiveness. The one-package type (i.e., Type I) stabilizer additive has all of the additives, including the biocide, blended together in one container. The additives are supplied under several different brand names as listed in QPL-53021. The recommended treat rate varies with brand name and is specified in the QPL. Mixing tips. When possible, bulk fuel supplies should be treated prior to dispensing the fuel, rather than treating fuel in individual vehicle fuel tanks. Additive(s) should not be added to an empty fuel tank and should be kept away from water. Most effective addition of the additive is to add to a partially filled tank as the additional fuel subsequently being introduced will provide agitation. Addition in a flowing stream is also effective. After fuel in a vehicle is treated, fuel filters may need to be changed due to the accumulation of dead microbiological debris.

Observe proper safety precautions when handling additives. Handle the product in open areas with good ventilation and avoid excessive inhalation of vapors. During hot weather, which increases the vapor hazard, or if handling the additives in enclosed areas, use hydrocarbon vapor-absorbing respiratory protection. Avoid contact with skin and eyes by wearing protective gloves and goggles. Read the instructions on the container and the Materials Safety Data Sheet (MSDS) before handling the additives. Use the recommended protective equipment. In case of leaks or spills, follow the instructions in the MSDS for disposal.

	DESCRIPTION	
UNCLASSIFIED		
GROUND FUEL LUBRICITY	ENHANCEMENT USING CORROSION	INHIBITOR/LUBRICITY IMPROVER

MIL-PRF-25017 - Inhibitor, Corrosion/Lubricity Improver, Fuel Soluble (Metric)

mandated for use in all military aircraft turbine fuels (JP-4, JP-5, JP-8). It is supplied under several different brand names as listed in QPL-25017. The recommended dosage varies with brand name. It usually is not added at depot The MIL-PRF-25017 Corrosion Inhibitor/Lubricity Improver (CI/LI) is primarily an aircraft fuel additive or by using units but is supplied in the fuel by refiners. The additive can be added to ground fuels to enhance lubricity. The QPL places brands in two categories: category 1 for ground and aircraft fuels and category 2 for aircraft fuels only. It has been determined that at the recommended dosage it is an effective fuel lubricity

				0	(4)			ı
		70		80	27			
		STEM		70	21			
	age	FOR FUEL STORAGE AND VEHICLE FUEL SYSTEMS		°F <-50 40 -30 -20 -10 0 10 20 30 40 50 60	-7 -1 4 10 16 21 27			
	Ambient Temperature Range Usage	E FUF	EXPECTED TEMPERATURES	50	10			
	re Ran	ЕНІСІ	ERAT	40	4	MIL-PRF-25017		
	peratu	ND V	TEME	30	-1	AIL-PR		
	t Temj	AGE A	CTED	20	-7			
	nbien	STOR.	EXPE(10	°C <-46 40 -34 -29 -23 -18 -12			
	Aı	UEL S		0	-18			
		FOR F		-10	-23			
				-20	-29			
				-30	-34			
				40	40			
CCI.				<-50	<-46			
cilliancer				оF	$^{\circ}$			
	Application	★ Bulk and Intermediate	Fuel Storage	Tanks	⊁ Fuel	Transport	v enicies	
	NSN 6850-	01-180-1074						
	Military NATO Size Container Symbol Code	1 Gal 55 Gal						
	NATO Code	S-1747 1 Gal 55 Gal						
	Military Symbol	NONE						_
	Military Specification	MIL-PRF-25017 NONE						

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Additional instructions. It is recommended that addition of additives be accomplished at the wholesale level. Addition to ground fuels is best accomplished with fuel injectors that can control dosage. Second best option is to add in tank vehicles or in above ground tanks. Premix the additive with a small quantity of fuel (about 0.5 % of the quantity of fuel to be treated) and add to the tank before the bulk fuel. Mixing is accomplished by recirculation within the tank. Mixing time can be estimated by using the following formula: mixing time (min.) = 1/2 (fuel quantity)/(recirculating pump capacity). If premix must be poured over the top of the fuel, mixing time should be doubled. If recirculation is not possible, mixing may be achieved by movement of the tank. Tank vehicle should be driven at moderate speed over rough terrain for a minimum of fifteen minutes or on a highway for 30 minutes. In general, the MIL-PRF-25017 additive is considered mildly hazardous. The hazard varies with the formulation used, check with the Material Safety Data Sheet (MSDS) supplied with the additive. Avoid contact with skin and eyes by wearing protective gloves and goggles. In case of leaks or spills, follow the instructions in the MSDS for disposal. When recirculating fuel within a tank, be sure to ground the discharge nozzle to the tank body.

	GASC	ILIN	GASOLINE FUELS	ST		UNCLASSIFIED DESCRIPTION
ASTM D 4814 - A-A-52530 - G	ASTM D 4814 - Specification for Automotive Spark-Ignition Engine Fuel A-A-52530 - Gasohol, Automotive, Unleaded	Automoti e, Unlead	ve Spark-Igni led	ition Engine Fuk	le le	These fuels are intended for ground combat, tactical and administrative vehicles and combat service support equipment as indicated in vehicle/equipment manuals. ASTM D 4814 (gasoline) for CONUS use, and NATO F-57 for OCONUS use, cover gasoline fuels suitable for use in spark-ignition (gasoline) engines and equipment designed to utilize gasoline. A-A-52530 is gasohol and contains 10% volume denatured ethanol in gasoline.
Specification	Military Symbol	NATO Code	Size Container	NSN 9130-	Application	Temperature Range Usage
ASTM D 4814 Special grade Regular grade Midranga grade			Bulk Bulk	00-148-7102 00-148-7103	* Ground Gasoline Engines and	FOR FUEL STORAGE AND VEHICLE FUEL SYSTEMS EXPECTED TEMPERATURES
Premium grade			Bulk Bulk	01-2/2-0983 00-148-7104	Gasoline Fueled Equipment	°F <5.50 4.0 -34 -29 -23 -18 -12 -7 -1 4 10 16 21 27 32 38 44 49
A-A-52530 Limited Grade Regular Grade Midrange Grade Premium Grade			Bulk Bulk Bulk Bulk	01-090-1092 01-090-1093 01-355-2393 01-090-1094		Gasoline, Gasohol

Comments: ASTM D 4814 (gasoline) allows the use of oxygenates to enhance antiknock quality and for the reduction of vehicle emissions. The use of gasoline fuels containing oxygenates designated as reformulated gasoline is mandated within parts of the U.S. by the Clean Air Act Amendments (CAAA) of 1990. STANAG 2845 covers NATO Code F-57 (GASOLINE, LOW LEAD, 91 RON) and NATO Code F-67 (GASOLINE, UNLEADED, 95 RON) as alternate fuels to ASTM D4814 for OCONUS only. F-57 can only be used with designated vehicles not equipped with catalytic converters.

DIE	SELA	L QN	[URB]	DIESEL AND TURBINE FUELS	ELS	UNCLASSIFIED DESCRIPTION
ASTM D 975 MIL-DTL-5624 MIL-DTL-83133* ASTM D 1655	1 1 1 1	Standard Specification for D Furbine Fuel, Aviation, Gra Furbine Fuel, Aviation, Ker NATO F-35, and JP-8+100 Standard Specification for A	 Standard Specification for Diesel Fuel Oils Turbine Fuel, Aviation, Grades JP-4, JP-5 Turbine Fuel, Aviation, Kerosene Type, N/NATO F-35, and JP-8+100 Standard Specification for Aviation Turbino 	Standard Specification for Diesel Fuel Oils Turbine Fuel, Aviation, Grades JP-4, JP-5 Turbine Fuel, Aviation, Kerosene Type, NATO F-34 (JP-8) NATO F-35, and JP-8+100 Standard Specification for Aviation Turbine Fuels	F-34 (JP-8) els	AR 70-12 provides the policies and responsibilities for use of liquid hydrocarbon fuels and identifies the primary, alternate, and emergency fuels for use in Army materiel. Diesel and turbine fuels are identified in AR 70-12 and are intended for use in ground combat, tactical and administrative vehicles and equipment as indicated in vehicle/equipment manuals. ASTM D 975 covers commercial diesel fuels designated Grade No.1-D (S15, S500 and S5000), Grade No. 2-D (S15, S500 and S5000) and Grade No. 4-D. It is recommended that the low sulfur (S15) fuels be used. Off-road, non-taxed, fuels will contain a red dye. DF-2,(F-54), is highsulfur fuel for use outside the U.S., territories and possessions. MIL DTL-83133 (JP 8), MIL DTL 5624 (JP-5), and ASTM D 1655 (JET A-1) cover kerosene base turbine fuels suitable for use in all compression-ignition (diesel) and turbine engines, for OCONUS and CONUS use.
Specification	Military Symbol	NATO	Size Container	NSN	Application	Temperature Range Usage
ASTM D 975	LS-1 LS-2		Bulk Bulk	9140- 01-398-1130 01-398-0697	★ Ground Diesel and	FOR ENGINES AND OTHER FUEL CONSUMING EQUIPMENT
					Turbine Engines	°F <-50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 110 110 120
MIL-DTL-5624	JP-5	F-44	Bulk	9130- 00-273-2379	★ Turbine and Diesel Engines	°C <-46 -40 -34 -29 -23 -18 -12 -7 -1 4 10 16 21 27 32 38 44 49 DL-1 (Winter grade diesel füel)
MIL-DTL-83133	JP-8	F-34	Bulk	01-031-5816	T	DL-2, DF-2 (Regular grade diesel fuel) JP-5, JP-8, JET A-1 (Turbine fuel, kerosene type)
ASTM D 1655	JET A-1^	F-35	Bulk	00-753-5026		
	^ See comments	F 6				Comments Note: Temperature usage limits for diesel fuels are based on average or specification values of flash and cloud points. Cloud point is adjusted for different geographical/climatic areas.

Comments: MIL-DTL-83133 (JP-8) will be used as the primary fuel in all theaters in accordance with the Single Fuel on the Battlefield policy following DOD Directive 4140.25 and AR 70-12. JET A-1, even though equivalent to JP-8, does not contain the additives required under JP-8. The additives required in JP-8 enhance the lubricity properties of the fuel preventing fuel pump wear in rotary-type fuel distribution injection pumps. However, this is not true for Jet A-1 and its use could result in fuel pump wear problems unless the equipment has been retrofitted with arctic equipment. For this reason, JET A-1 is not recommended for use in ground diesel engine equipment unless the fuel is additized to meet the recommended concentration of the corrosion inhibitor/lubricity improver (CI/LI) additive in accordance with QPL-25017.

*JP-8+100 is not approved for use in Army systems.

	B20 E	3IOD	IESEL	B20 BIODIESEL FUEL		UNCLASSIFIED DESCRIPTION		
A-A-59693	- Diesel F	uel, Biodie	- Diesel Fuel, Biodiesel Blend B20	0		B20, a fuel blend composed of 20 volume percent biodiesel conforming to ASTM D 6751 and 80 volume percent diesel conforming to ASTM D 975, B20 has been designated as an alternative fuel by the Department of Energy and the Environmental Protection Agency. Biodiesel is defined in ASTM D 6751 as "a fuel composed of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100	ng to ASTM D 6751 and 80 volume I rrative fuel by the Department of Ener. D 6751 as "a fuel composed of mones, designated B100	percent rgy and no-alkyl
						Biodiesel Specifications according to ASTM D 7467 for B20 with maximum sulfur content of 15ppm:	mum sulfur content of 15ppm:	
						1.4.	Aromaticity (%vol, max) 35 Water and Sediment (%vol, max) 0.05	
						Flash Point ($^{\circ}$ C, min) 52 Copper Corrosion Cloud Point ($^{\circ}$ C, max) E Biodiesel Content	(%, V/V)	
						re (°C, max) 343	Oxidation Stability (1,4) (1,4	
						40		
Specification	Military Symbol	NATO Code	Size Container	NSN 9140-	Application	Temperature Range Usage		
A_A_50603			Rull	01-470-4520	★ Ground	FOR ENGINES AND OTHER FUEL CONSUMING EQUIPMENT	AING EQUIPMENT	
C(0/C-X1-X1			Data	0761-071-10	Diesel Engines	EXPECTED TEMPERATURES	ES	
						OF <-50 -40 -30 -20 -10 0 10 30 40 -	50 60 70 80 90 100 110	120
						 <-46 -40 -30 -23 -18 -17 -1 4 	16 21 27 32 38	_
						B20		-
						Note: Temperature usage limits for diesel fuels are based on cloud points using the minimum tenth percentile values	s using the minimum tenth percentile va	/alues
						as guidelines. Cloud point is adjusted for unfelting geographical/cliniatic areas to accommodate the seasonal changes. The temperature usage limits of B20 would be based upon the same minimum tenth percentile values that are given in A-A-59693 or ASTM D 975.	c areas to accommodate the seasonat chi imum tenth percentile values that are g	given in
Comments: Altho	ugh A-A-596	93 (B20) c.	an be used in	lieu of ASTM	D975 (diesel fuel)	Comments: Although A-A-59693 (B20) can be used in lieu of ASTM D975 (diesel fuel) in conventional diesel engines without any hardware changes necessary, it is not approved for use in combat/tactical continuents. The maximum period for storing B20 is 6 months (and the initial acid number must not exceed 0.2 max KOH/n complex). The maximum period for storing B20 is 6 months (and the initial acid number must not exceed 0.2 max KOH/n complex). The maximum period for storing B20 is 6 months (and the initial acid number must not exceed 0.2 max KOH/n complex).	, it is not approved for use in combat/t	tactical

equipment. The maximum period for storing B20 is 6 months (and the initial acid number must not exceed 0.2 mg KOH/g sample). There is only one grade of B20. The Energy Conservation Reauthorization Act (ECRA) of 1998, an amendment to the Energy Policy Act (EPACT) of 1992, permits Federal Agencies to use biodiesel to meet a portion of their alternative fueled vehicle (AFV) acquisition requirements. Section 312 (Biodiesel Fuel Use Credits) of ECRA permits Federal Agencies to meet up to 50% of their AFV acquisition requirements by using biodiesel fuel. Under the new provisions, each 450 gallons of pure biodiesel (B100) used in a vehicle weighing over 8500 pounds counts as one full AFV credit. Since biodiesel is typically used as B20, using 2250 gallons of B20 equates to one AFV credit under EPACT.

MIL-PRF-680, DEGREASING SOLVENTS	F-680,	DE	GREA	SING SC	OLVENTS	UNCLASSIFIED DESCRIPTION
MIL-PRF-680 - Degreasing Solvent	egreasing Solv	vent				MIL-PRF-680 is a petroleum distillate degreasing solvent used for degreasing of machine parts in equipment maintenance. It is also known as "mineral spirits" or as "petroleum spirits." There are four types. Type I is an odorless Stoddard Solvent. It is intended to be used as a relatively safe dry cleaning solvent. When used indoors, adequate ventilation must be available to avoid excessive accumulation of vapors. Type II is an odorless high flash point (140°F) solvent. It should be used where a higher flash point solvent is required. When used indoors, adequate ventilation must be available to avoid excessive accumulation of vapors. Type III is an odorless 200°F flash point solvent. It is intended for used where a very high flash point is required and where conditions require that an odorless product is needed. It has a slower evaporation rate than Types I and II, and IV. Type IV is a citrus based hydrocarbon solvent. The performance of this solvent is very similar to Type II solvent. Type V is a low VOC solvent. The performance of this solvent is very similar to Type II solvent.
Military Specification	Military Symbol	NATO Code	Size Container	NSN 6850-	Application	Ambient Temperature Range Usage
MIL-PRF-680 Type I	SD-1 S	S-752	1 Gallon 5 Gallon 55 Gallon	01-474-2302 01-474-2309 01-474-2313	* Degreasing & for metal parts where flammability is not an issue.	°F <-50 -40 -34 -29 -23 -18 -12 -7 -1 4 10 16 20 20 -60 70 80 90 100 110 120 °C <-46
MIL-PRF-680 Type II	SD-2	S-753	1 Gallon 5 Gallon 55 Gallon	01-474-2319 01-474-2317 01-474-2316	* General degreasing for metal parts.	SD-2 (S-753) SD-3 (S-760) SD-4 (S-760)
MIL-PRF-680 Type III	SD-3	S-760	1 Gallon 55 Gallon	01-474-2318 01-474-2320 01-474-2321	* Degreasing for metal parts in confined areas or where high flash point is required.	SD-5
MIL-PRF-680 Type IV	SD-4		Pint 1 Gal 5 Gal 55 Gal DR	01-472-2723 01-472-2722 01-472-2717 01-472-2719	* General degreasing solvent for metal parts.	
MIL-PRF-680 Type V	SD-5		1 Gal 5 Gal %% Gal	01-584-7237 01-584-7241 01-584-7227	* Low VOC solvent and general degreasing for metal parts	
Comments: MIL-P	RF-680 is an o	environm	entally comp	laint solvent and	d low toxic solvent.	Comments: MIL-PRF-680 is an environmentally complaint solvent and low toxic solvent. Typically, Type V is EPA VOC exempt solvent. However Type I is a flammable solvent due to its low flash point.

Comments: MIL-PRF-680 is an environmentally complaint solvent and low toxic solvent. Typically, Type V is EPA VOC exempt solvent. However Type I is a flammable solvent due to its low flash point. All should be disposed of as a regulated hazardous waste or can be recycled.

	CLEA	ININ	G CON	CLEANING COMPOUND	D	UNCLASSIFIED	DESCRIPTION
MIL-PRF-372	- Cleaning C Automatic	Cleaning Compound, Solvent Automatic Aircraft Weapons)	Solvent (For l	MIL-PRF-372 - Cleaning Compound, Solvent (For BORE of Small Arms and Automatic Aircraft Weapons)	Arms and	MIL-PRF-372 is a highly penetrating, aircraft weapons. The material provid	MIL.PRF-372 is a highly penetrating, mobile liquid intended for use in cleaning the bores of small arms and automatic aircraft weapons. The material provides a temporary rust-resistant coating for the cleaned surface.
Military Specification		Military NATO Symbol Code	Size Container	NSN 6850-	Application		Ambient Temperature Range Usage
MIL-PRF-372 RBC	RBC	I	2-0z. 8-0z. 1-Quart 1-Gal	00-224-6656 ★ Cleaning 00-224-6657 compound 8 00-224-6658 temporary 00-224-6663 preservative	★ Cleaning compound and temporary preservative	°C < -46 -40 -30 -20 -10 0	EXPECTED TEMPERATURES 0 10 20 30 40 50 60 70 80 90 100 110 120 -18 -12 -7 -1 4 10 16 21 27 32 38 44 49 RBC

Comments: MIL-PRF-372 provides temporary preservation of metal and removes primer salts.

	LUBRICATING OIL	ICA	LING (ЭП		UNCLASSIFIED DESCRIPTION	
MIL-DTL-53131 - Based	MIL-DTL-53131 – Lubricating Oil, Precision Rolling Element Bearing, Polyalphaolefin Based	recision	Rolling Eleme	ent Bearing, Pol	yalphaolefin	MIL-DTL-53131 lubricating oils are intended for use in the precision bearings of inertial guidance gyros, accelerometers and other suitable instrument bearing applications.	gyros,
Military Specification	Military Symbol NATO (Grade)	NATO Code	Size Container	NSN 9150-	Application	Ambient Temperature Range Usage	
MIL-DTL-53131	Grade 4	NONE		01-498-0268 01-498-0315	Precision	EXPECTED TEMPERATURES	120
			55-Gal	01-498-0014	Bearing Application	C-30 40 -30 40 30 60 70 60 70 100 110	49
	Grade 6	NONE	1-Gal 5-Gal	01-498-1483 01-498-1468		Grade 4	
			55-Gal	01-498-1481		Grade 6	
	Grade 9	NONE	1-Gal	In process		Grade 9	
			5-Gal 55-Gal			Grade 14	
	Grada 17	NON	16,51	01-498-1518		Grade 40	
	Olade 14	NOINE	5-Gal	01-498-1492			
			55-Gal	01-490-140/			
	Grade 40	NONE 1-Gal 5-Gal 55-Gal	-Te	01-498-1522 01-498-1523 01-498-1524			

Comments: MIL-DTL-53131 covers five different grades of synthetic oils according to their viscosity properties. This specification allows the users the option of using specified oils with the optimum viscosity and operating temperatures for the applications.